

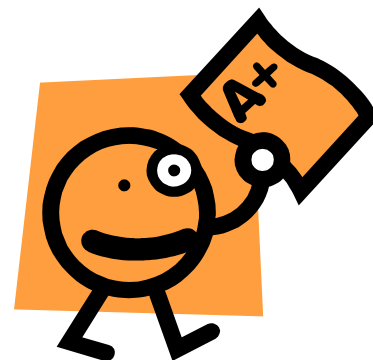
Assessing Understanding in Upper Grades Math



**General & Analytic Rubrics
for Performance Task Assessments**

PERFORMANCE TASK RUBRICS

Assessing Understanding with General & Analytic Rubrics



The General Task Rubric:

One of the loudest complaints against performance tasks is that they are difficult and time consuming to grade. It is important to me that this complaint is unfounded so that I, as the teacher, will be motivated to use performance tasks and not deterred by the perceived workload. To that end, I try to design grading rubrics that are:

General—Categories contain general descriptions of the requirements for that score. The descriptions are about the *quality* of the work and do not include any answers, so that the student can (and should) be given the rubric with the task.

Clear & Consistent—I use the same categories on every rubric and I try to give the descriptions a common element too. A score of '3/Proficient' always means that you demonstrated a **solid** understanding of the material.

Easily Translatable to my gradebook—This has always been a challenge, so I have settled upon the following method that suits me well:

1. I circle the category that I believe the student has demonstrated, allowing myself permission to award a 'plus' if necessary (for example, I might award a 'Developing +' if I believe that the student doesn't quite have a solid understanding, but they were better than developing)
2. The number scores (plusses are awarded 0.5 additional points) are converted to 'gradebook grades' so that the categories roughly translate to Exels(A), Proficient (B), Developing (C), Beginning (D), Lacks Understanding (F). I use the following formula/chart:

$$\text{Final grade} = (2 * \text{score} + 11) / 20 \text{ points}$$

Category	#	Points/20	Grade
Excels +	4.5	20/20	100%
Excels	4.0	19/20	95%
Proficient +	3.5	18/20	90%
Proficient	3.0	17/20	85%
Developing +	2.5	16/20	80%
Developing	2.0	15/20	75%
Beginning +	1.5	14/20	70%
Beginning	1.0	13/20	65%
Lacks Understanding +	0.5	12/20	60%
Lacks Understanding	0.0	11/20	55%
Blank Paper	-	0/20	0

The Analytic Weighted Rubric:

While the general rubric should suffice for overall assessment purposes, I find that I have certain criteria in my head about what I'm really looking for in a 'Proficient' or 'Beginning' paper. The analytic weighted rubric attempts to quantify these expectations for the students and myself in a generalized capacity. Typically, this is a good rubric to give the students before the first performance task they try. Talking through the various expectations provides them a solid foundation for demonstrating their own understanding. This rubric can also be used as a back up if a student fails to fall neatly into a general category on the task rubric... in which case the three categories (mathematical content, problem solving, communication) are weighted equally and the scores can be averaged to determine the appropriate general category/score.

PERFORMANCE TASK RUBRIC

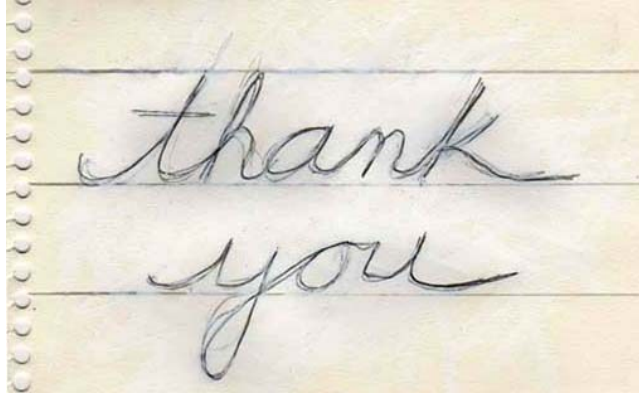
Content Standard:



Rating	Description
-	Blank Paper
0 Lacks Understanding	Task is attempted, but work is completely unreasonable or nonsensical.
1 Beginning	<p>Your work demonstrates a rudimentary understanding of the content standard. You may have recognized a need for particular models and/or equations, but you were not able to make adequate progress towards a reasonable solution. Alternatively, you may have answered the questions in a word or two, but failed to provide any justification.</p> <p>See me for further guidance, please.</p>
2 Developing	<p>Your work demonstrates a basic understanding of the content standard. For example, you may have set up the correct model, but made several errors or omissions leading to incorrect or incomplete solutions. Alternatively, you may have arrived at correct solutions, but failed to verify them with explanations that allow me to reproduce your thinking.</p> <p>Keep it up though. You are making progress.</p>
3 Proficient	<p>Your solutions and explanations demonstrate a solid understanding of the content standard.</p> <p>Your solutions are reasonably correct (to nearest whole number) and your explanations/illustrations are thorough and mathematically sound.</p> <p>Congratulations on a job well done!</p>
4 Excels	<p>Beyond proficient, your work is thoughtful, comprehensive, elegant and precise. Your answers are expressed in exact form and your explanations are clear and thorough—making your train of thought easy to follow.</p> <p>Your work demonstrates an exemplary understanding of this unit's content.</p> <p>May I have permission to share your paper with others as a solution key?</p>

PERFORMANCE TASK ASSESSMENT RUBRIC

	Mathematical Content	Problem Solving	Communication
	Knowledge of mathematical principles and concepts that result in a correct solution to a problem.	Identification of important elements of the problem & the appropriate use of multiple methods to verify, justify, & emphasize the solution.	Written explanations and rationales that translate the steps of the solution process into words and diagrams: providing justification for each step.
Key Question	<i>Does the student's interpretation accurately reflect the important mathematics in the problem, and is the solution process performed in an accurate & complete manner?</i>	<i>Is there evidence that the student proceeded from a plan and their approach to the problem was thorough, thoughtful, logical, creative, and/or elegant?</i>	<i>Was I able to easily understand the student's thinking, or did I have to make inferences & guesses about what they were trying to do?</i>
4 Excels	<p>Your work shows a <u>complete</u> understanding of the problem's mathematical concepts.</p> <ul style="list-style-type: none"> You use the correct formulas and mathematical procedures. All computations are complete and correct and written in an appropriately precise form. You use appropriate mathematical language and notations including correct labels and units. 	<p>You identify <u>all</u> of the important elements of the problem and show a <u>complete</u> understanding of the relationships among them.</p> <ul style="list-style-type: none"> You make appropriate use of multiple methods to illustrate your solution. You may show particular creativity, originality, or elegance in your solutions or procedures. 	<p>Your <u>complete</u> written explanations <u>clearly</u> explain both <u>what</u> was done & <u>why</u> it was done.</p> <ul style="list-style-type: none"> You include an in-depth explanation of your reasoning that was clear, concise & thoughtful. You use correct grammar & complete sentences when appropriate. You use appropriate diagrams/graphs that were carefully drawn and thoroughly labeled.
3 Proficient	<p>Your work shows a <u>nearly complete</u> understanding of the problem's mathematical concepts.</p> <ul style="list-style-type: none"> All parts of the problem are solved completely using an appropriate process. Minor computational errors may lead to imperfect (but sensible) results. Minor omissions of mathematical language or notation still leave meaning clear. 	<p>You identify <u>most</u> of the important elements of the problem and show a <u>general</u> understanding of the relationships among them.</p> <ul style="list-style-type: none"> You emphasize your solution by utilizing more than one method to solve the problem (when appropriate). You are able to make connections between some of the elements of the problem. 	<p>Your <u>nearly complete</u> written explanations explain <u>what</u> was done and <u>begin</u> to explain <u>why</u> it was done.</p> <ul style="list-style-type: none"> You include appropriate diagrams with most parts labeled and explained You use correct grammar & complete sentences when appropriate. While not exceptionally thorough, your explanations were clear enough for me to deduce what you were thinking.
2 Developing	<p>Your work shows <u>some</u> understanding of the problem's mathematical concepts.</p> <ul style="list-style-type: none"> Some parts of the problem are unattempted or nonsensical. Minor computational errors may lead to unreasonable answers, Your use of mathematical language and notations is incomplete or inaccurate. 	<p>You identify <u>some</u> of the important elements of the problem and show a <u>limited</u> understanding of the relationships between them.</p> <ul style="list-style-type: none"> Your chosen strategy may be incomplete or improperly executed. You may have chosen an inefficient or overly cumbersome strategy. 	<p>Your written explanations <u>attempt</u> to explain what was done or why it was done, but may be vague or <u>difficult to interpret</u>.</p> <ul style="list-style-type: none"> You include appropriate diagrams, but they are neither labeled or explained properly; You fail to write in complete sentences and do not use correct grammar.
1 Beginning	<p>Your work shows a <u>limited</u> understanding of the problem's mathematical concepts.</p> <ul style="list-style-type: none"> You attempt to follow a mathematical process, but most parts of the problem are unattempted or nonsensical. Contains major computational or mathematical errors. Answers appear ("guess") with no mathematical justification ("check"). 	<p>You <u>fail to identify</u> important elements of the problem or you place too much emphasis on <u>unimportant</u> elements.</p> <ul style="list-style-type: none"> You may have chosen an inappropriate or inconsistent strategy for solving the problem. Your intent is unclear and lacks follow-through. 	<p>Your written explanations are <u>minimal</u> and <u>fail to explain</u> what was done and why it was done.</p> <ul style="list-style-type: none"> Your explanation may not match your solution process. Your explanations are unclear, inconsistent, and/or difficult to decipher. You fail to use and explain important diagrams.
0 Lacks Understanding	Little or no evidence of any mathematical processes shown.	Little or no apparent strategy.	Little or no written explanation of the solution process is provided.



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